well known to me when I held the office of Chancellor of the University of Wales. I feel confident that increased efficiency will result from the facilities afforded by the commodious premises of which I have to-day laid the first stone. The competition in every branch of industry, especially in those branches which depend largely on science and art, is in these days severe, and it must be met by increased application and improved methods. The world is, I believe, better for such competition, but it behoves individual nations to use every possible effort to hold their own in the struggle. For this purpose higher education is an absolute necessity. However brilliant a man's natural talents may be, he is greatly hindered by the want of early training, and as a rule only those who have enjoyed a good education are capable of acquiring such proficiency in any branch of study as will enable them to succeed. The University College of North Wales will offer to its students exceptional opportunities of instruction. Time and money, energy and perseverance, will, I am sure, not be spared in the endeavour to afford every facility to the acquirement of knowledge, and I have had sufficient opportunities of judging the intelligence of the Welsh people and their eagerness in the pursuit of knowledge to know that your young men and women will take every advantage of the instruction which is offered them.

At the close of the ceremony of laying the foundation stone, the King conferred the honour of knighthood upon Dr. H. R. Reichel, the principal of the college.

NOTES.

WE regret to announce that Sir William H. Broadbent, Bart., F.R.S., physician in ordinary to the King and to the Prince of Wales, died on Wednesday, July 10, at seventy-two years of age.

THE Nettleship gold medal of the Ophthalmological Society of the United Kingdom has been awarded to Dr. J. Herbert Parsons, for his work on "The Pathology of the Eye."

THE council of the Institution of Civil Engineers has appointed Sir William Matthews, K.C.M.G., president of that institution, to succeed the late Sir Benjamin Baker, K.C.B., K.C.M.G., as one of their representatives on the main committee of the Engineering Standards Committee.

THE annual meeting of the Victoria Institute will be held at Burlington House, Piccadilly, on Wednesday, July 17. The chair will be taken by the president, the Earl of Halsbury, F.R.S.; and an address will be given by Bishop Welldon.

THE Women's Agricultural and Horticultural International Union will hold an exhibition and sale of farm and garden produce, and of nature-study teaching apparatus, in the gardens of the Royal Botanic Society, Regent's Park, on Wednesday, July 17. For the convenience of teachers, the nature-study room will be kept open until Saturday, July 20.

THE vacancy in the tidal and optical departments of the National Physical Laboratory, occasioned by the appointment of Mr. J. de Graaf Hunter to the post of mathematical expert on the Indian Survey, has been filled by the appointment of Mr. T. Smith, formerly scholar of Queens' College, Cambridge.

THE recent death of M. Charles Trépied, director of the Algiers Observatory, inflicts yet another severe loss on the ranks of French astronomers. In the organisation of the work of the Astrographic Catalogue and Chart he played an active and prominent part from the beginning, and it is to be deplored that he was not spared to see the completion of his labours. M. Trépied became director of the observatory at Algiers in 1880, and in the following year carried out a scheme of reorganisation. In 1883 the observatory was removed from its temporary site at Kouba to its present position at Bondzavéah, eleven kilometres from Algiers, and was further equipped with an equatorial *coudé*, and later with a photographic instrument of the standard photographic pattern. Since 1875 M. Trépied was a prolific writer on all branches of astronomy, and gave much study to the physical condition of the sun and to cometary spectra, while the observatory under his charge was always most active in observational work of all kinds. On the occasion of the solar eclipse of 1900, he extended the most generous hospitality and assistance to the foreign astronomers who visited Algiers. He was a corresponding member of the Paris Academy of Sciences.

PROF. W. J. SOLLAS, F.R.S., professor of geology and palæontology at Oxford, and his assistant, Mr. M. Allorge, have just taken the geological class to Belgium to study the structure of that country. In the Easter expedition of the students, Dr. Vaughan and Prof. Reynolds explained the zoning of the Carboniferous limestone in the Bristol district; and the object of the present expedition is to bring the results then obtained into comparison with the facts furnished by the Belgian limestones. The leading Belgian geologists, MM. Mourlon, Gosselet, Halet, Simoens, Lohest, Formarié, and Rutot, are acting as guides for the various visits and excursions which have been arranged. The expedition thus provides facilities for geological observations under the best conditions.

THE retirement is announced of Prof. G. Lunge, at the age of sixty-eight, from the chair of technical chemistry at Zurich, a position which he has held during the past thirty-one years. Prof. Lunge's name is intimately associated with the development of chemical industry in Germany, not only on account of the influence he exerted on his many students, but more directly owing to his inventions and treatises on applied chemistry. At the time when he, as a young man, completed his studies at Heidelberg, chemical industry had hardly come into existence in Germany, so that in order to gain practical experience he found it necessary to proceed to England. In this country, in which he spent the twelve years 1864–1876, he was first actively engaged in studying the problems connected with the distillation of coal tar, but subsequently acted as manager of a large soda works at Tyneside. He was one of the founders of the Newcastle Chemical Society, a precursor of the Society of Chemical Industry. In 1876 Prof. Lunge received a call to the professorship of technical chemistry at Zurich, a position which, in spite of many inducements to pass to other universities, he continued to occupy until this year. His books on coal-tar distillation and on the manufacture of acid and alkali have, since the publication of the first volume in 1879, become almost classics in chemical technology.

AN influentially signed appeal was published in the *Times* of July 5 for donations to a fund which is being raised to ensure the preservation of characteristic examples of the "grey wethers" on Marlborough Downs. These boulders are locally known as "Sarsen Stones," and are geologically the solidified boulders of a stratum of Eocene sand formerly covering the chalk which in the course of time has been denuded of the softer portions. For many generations these stones have been broken up and used for building and other purposes, but the breaking up has not been on such a scale as to make any appreciable difference in the appearance of the downs. A recent

change of ownership has made it likely that the process of destruction will be greatly extended. In these circumstances representations have been made to Mr. Alec Taylor, the present owner, by the National Trust and the Wiltshire Archæological Society, who has stated that he intends to preserve the dolmen known as the Devil's Den, and has given the National Trust an option to purchase for 500*l.* about eleven acres in Pickle Dean and about nine acres in Lockeridge Dean both of which areas are rich in "grey wethers." We trust the sum required will be forthcoming, so that examples of a unique geological phenomenon may be preserved to the nation. It is not too much to say that if British statesmen understood more fully the value and full significance of nature's "monuments," these and similar natural objects of scientific and educational importance would have been secured for the nation long ago. Donations to the fund which is being raised may be sent to Mr. Henry E. Medlicott, Potterne, Devizes; the Rev. E. H. Goddard, Clyffe Vicarage, Swindon; Mr. E. Meyrick, Thornhanger, Marlborough; or to Mr. Nigel Bond, 25 Victoria Street, Westminster.

THE thirty-sixth annual meeting of l'Association francaise pour l'Avancement des Sciences will be held at the lycée in Rheims on August 1–6. The president for the year is Dr. Henrot, honorary director of l'École de Médecine at Rheims. The work of the meeting will be divided among nineteen sections. The presidents in each case are as follows:—Sections 1 and 2 (Mathematics, Astronomy, Geodesy and Mechanics), Prof. C. Bourlet; Sections 3 and 4 (Navigation and Civil and Military Engineering), M. Bourguin; Section 5 (Physics), Prof. Blondin; Section 6 (Chemistry), Prof. Hugounenq; Section 7 (Meteorology), M. Luizet; Section 8 (Geology and Mineralogy), M. Peron; Section 9 (Botany), Prof. Lecomte; Section 10 (Zoology, Anatomy and Physiology), Prof. Caullery; Section 11 (Anthropology), Dr. Guelliot; Section 12 (Medical Science), Prof. Landouzy; Section 13 (Medical Electricity), Prof. Guilloz Section 14 (Odontology), M. Francis Jean; Section 15 (Agronomy), M. Armand Walfard; Section 16 (Geography), M. Richard; Section 17 (Political Economy and Statistics), Dr. Papillon; Section 18 (Pedagogy), Dr. Bérillon; Section 19 (Hygiene), Dr. Calmette. M. Jadart is the president of the subsection dealing with archæology. On August 5 an evening lecture will be delivered by Dr. S. Leduc, his subject being "Diffusion and Osmosis." A very full programme has been arranged, and it is possible here to refer to a few of the subjects only. In the physics section the properties of the electric arc will be dealt with, and their application to the production of (*a*) luminous rays, (*b*) electric waves for use in ordinary and in wireless telegraphy, (*c*) nitric acid and nitrates from the oxygen and nitrogen of the air. In the chemistry section the progress made in the study of sugars and the action of soluble ferments on gums will be discussed. In the geology section the classification of the Tertiary beds in the neighbourhood of Rheims will be considered Visits to places of interest have been arranged, and these include Verzenay, Epernay, Laon, Coucy, Charleville, Dinant, and the Han grottoes. Full particulars of the meeting can be obtained from the secretary to the council, 28 rue Serpente, Paris.

ACCORDING to a paper by Mr. H. Elias, published in *Gegenbaur's Morphologisches Jahrbuch*, vol. xxxvii., part i., the shrill cries of bats are, as might be expected, intimately connected with the structure of the larynx in those animals. Special features are the powerful musculature and the shortness of the glottis, the latter being the main cause of the shrillness of the cry. Details of the variation in structure of the larynx in different groups of insectivorous bats are given. In the same issue Dr. O. Brian gives an illustrated account of the so-called horny teeth on the tongue of the porcupine. These teeth form two isolated oval patches near the tip of the tongue, and although their existence has been long known, the author of the paper claims that he is the first to describe their histology.

FROM a natural history point of view, the *National Geographic Magazine* for June is an unusually interesting number. Among its contents is an article by Prof. A. Heilprin on the Guiana wilderness, in the course of which reference is made to the statement that the tropical American forest is characterised by the absence of flowers. "The picture," observes the author, "does not seem to apply to the forest of the river-banks of the Guianas. . . . The streamers of purple, red, and white which hang down over the forest-curtain easily recall in profusion and wealth of colour the flowers of the north. . . . Indeed, it would be difficult to recall in forests of the north, even as rare instances, that display of flowers which so frequently repeats itself here." Another article to which attention may be directed is one by Mr. H. M. Smith, Deputy Commissioner of U.S. Fisheries, on fish immigrants. It deals largely with the objects and results of fish-acclimatisation in the United States.

"SELECTION and Cross-breeding in Relation to the Inheritance of Coat-pigments and Coat-patterns in Rats and Guinea-pigs" is the title of a paper by Messrs. H. MacCurdy and W. E. Castle recently published by the Carnegie Institution of Washington. After a general discussion on continuous and discontinuous variation as factors in evolution, the authors point out that partial albinism displays itself in rats in a fashion quite distinct from that obtaining in guinea-pigs. In the one group the dark areas tend to become restricted to certain definite parts of the body, while in the other they become irregularly distributed everywhere. In rats pigment-reduction produces a regular series of coat-patterns, each of which breeds true within certain limits. In the case of guinea-pigs regression appears to be indicated by a reduction in the number of pigmented areas; but its occurrence could not be definitely determined in rats. If regression does occur in both groups, the main question is whether we can "with propriety consider the effects of selection permanent. . . . We consider the selection question still an open one."

AMONG several articles in the *Zeitschrift für wissenschaftliche Zoologie*, vol. lxxxvi., part iv., reference may be made to one by Mr. Hermann Jost, of Göttingen, on the developmental history of the larva of the ox-warble fly, *Hypoderma bovis*. From the absence of any reference to it in his list of literature, the author appears to be unacquainted with the paper on the same subject by Mr. A. D. Imms in vol. i., part ii., of the *Journal of Economic Biology*, of which a brief notice appeared in our columns some months ago. Mr. Imms was unable to obtain satisfactory evidence as to the manner in which the larvæ effect entrance into the bodies of the host, that is to say, whether they do so by perforating the skin or by way of the mouth. Dr. Cooper Curtice in an earlier paper came, however, to the conclusion that the young larvæ are licked up by the cattle, and thus conveyed to the alimentary canal. According to Mr. Jost, this is not quite

the true explanation, as his observations lead to the conclusion that the eggs are never hatched on the exterior of their host, but are licked off from the skin by the tongue to undergo their final development in the alimentary canal. Estimates of the enormous commercial losses due to ox-warbles are given in the course of the paper.

THE rind disease of the sugar cane caused by the fungus *Melanconium sacchari* forms the subject of Bulletin No. 7 prepared by Mr. L. Lewton-Brain, of the division of pathology and physiology, and issued from the experiment station of the Hawaiian Sugar Planters' Association. The fungus can only penetrate the cane by wounds due to borers or other agents, but, having penetrated, readily forms fruiting masses from which arise the conidia that are extruded in long black threads. Reference is also made to the "red-rot" fungus, *Colletotrichum falcatum* and to the pine-apple disease induced by *Thielaviopsis ethaceticus*, a fungus that is sometimes regarded as a stage in the life of the Melanconium.

THE introduction of rubber cultivation into the Malay Peninsula has brought the Federated Malay States and the Straits Settlements into prominence, and with the view of supplying information as to their status and resources Mr. H. C. Belfield has prepared a third edition of the "Handbook of the Federated Malay States." The handbook contains much practical information, both for the settler and the tourist; an estimate of the cost of starting a rubber plantation is provided for the planter. As to other crops, the west coast from Perak to Negri Sembilan is well suited to the cultivation of cocoa-nuts, but coffee plantations will cease to exist as the interplanted rubber trees come into bearing, and owing to the wasteful methods adopted, tapioca cultivation is being discouraged. Measures are being adopted to conserve the trees yielding gutta-percha.

TWO curious substances, n'hangellite and coorongite, that have been described as mineral india-rubber or elastic bitumen, the former discovered in Portuguese East Africa, the latter in Australia, are the subject of an article in the Kew Bulletin (No. 5). After examination, Mr. L. A. Boodle arrives at the conclusion that they have been derived chiefly from masses of a gelatinous blue-green alga, and that the bituminous character is due to chemical changes. An account of the method of preparing amber-coloured biscuits of Funtumia rubber in Uganda is based upon a communication by Mr. H. Hesketh-Bell. On the subject of mud-binding grasses that might be utilised to reclaim sand and mud-flats, information is provided with regard to the growth of species of Spartina in Southampton Water. A long list of moths collected during the season of 1906, supplementary to the species recorded in the special volume of the Kew Bulletin on the wild fauna and flora of the gardens, is contributed by Mr. A. L. Simmons.

THE University of California, from funds supplied by Mrs. P. A. Hearst, has added to its series of monographs on American ethnology an account of the language of the Yokuts in the south central region. This tribe, the name of which means "men," inhabits the southern portion of the San Joaquin basin. It includes some forty sub-tribes, each with a distinct dialect, differences of vocabulary being probably due, partly, as among the Nagas of Assam, to inter-tribal feuds, and partly to the taboo of words connected with the dead. The Yokuts are now gradually disappearing, and the author of this monograph, Mr. A. L. Kroeber, has found much difficulty in collecting the materials for a comparative grammar and chrestomathy, the latter including some interesting tribal legends and folk-lore, more complete versions of which he proposes to publish in a subsequent volume.

THE weather still continues most persistently cold for the time of year over the whole of the British Islands, and, indeed, over nearly the whole of western Europe. Rain is falling with considerable frequency, but the measurements are not generally large. The principal feature is the large amount of cloud and the consequent small amount of sunshine. According to the summary of the weather issued by the Meteorological Office for the week ended July 6, the maximum temperature recorded anywhere in the British Islands was 68°, in the Midland counties. The defect of temperature on the mean for the period was mostly from 6° to 8°, whilst the bright sunshine was deficient over the whole of Great Britain. At Greenwich the highest shade temperature for the first nine days of July was 68°, and the observations since 1841 fail to show any other year for the same period with so persistently low a temperature, the previous years always having had a temperature of 70°, and commonly a temperature of 80° or even 90°. The mean highest temperature for the first nine days is rather below 65°, which is in agreement with the average conditions in the middle of May or the end of September. The aggregate rainfall at Greenwich for the first nine days of July is less than 0·2 inch, but rain has fallen on six days. The aggregate rainfall at the London reporting station of the Meteorological Office since the commencement of the year is 8·8 inches, which is about 1·5 inches less than the normal, and April is the only month with an excess of rain. The present outlook promises a further continuance of cool and unsettled weather.

THE Deutsche Seewarte has just published vol. xiv. of *Deutsche Ueberseeische Meteorologische Beobachtungen*, containing summaries of the meteorological observations made at thirty-eight foreign stations for various periods between 1892 and 1904. The first part includes the records from twenty-six stations where the observations were made three times a day, the stations being well scattered over the globe. Labrador, West Indies, Brazil, Morocco, Liberia, Siberia, China, Corea, and the Pacific Islands are all represented. The value of these otherwise good observations is marred by the fact that only from eight of the stations can a continuous record be got for so short a period as three years. The second part contains the results of hourly observations at stations which are all in German East Africa, and deals with the period 1900–4. Here again is the same trouble of discontinuity.

"DISTRIBUTION of Temperature and Air Pressure over the Globe in the 'Polar Year' 1882–3" is the title of the inaugural dissertation chosen by S. B. Ehrhart on obtaining his doctor's degree at Erlangen. It was a gigantic undertaking, and the results of observations at 924 stations have been utilised in preparing isothermal and isobaric charts for each month from September, 1882, to August, 1883; the charts for January and July, 1883, accompany the dissertation. The author states that, on the whole, the charts for this particular year exhibit the same general features as those drawn from means for a series of years, and show that the temperature conditions of any one month influence the pressure conditions of the following month, *e.g.* areas of high temperature favour the development of barometric minima, and *vice versâ*. We fail to find any reference to the synchronous weather charts of the North Atlantic published by the Meteorological Office for that

year, which, although not dealing with mean values, constitute the greatest investigation of synchronous meteorology ever undertaken by any country.

THE paper on the theory of thermoelectricity contributed by Shizuwo Sano to the Proceedings of the Tokyo Mathematico-Physical Society, iv., 1 (February number, recently received), cannot fail to throw light or suggest ideas in connection with this difficult and controversial subject. It is usual to apply to thermoelectric phenomena the equations of reversible thermodynamics which would hold good in the absence of such irreversible phenomena as the Joule effect or conduction of heat, but the author, following on the lines indicated by Boltzmann in 188-, considers that the reversible and irreversible effects may be mutually interdependent. The paper does not claim to be free from assumptions which are not altogether justified, and in particular the deduced property of potential difference in relation to temperature may be open to question. The theory deserves careful consideration; but would it not be possible to throw it into a less analytical form?

THE first part has appeared of the *Rivista di Scienza*, of which a preliminary notice has been already given in these columns. It is an international journal somewhat similar in appearance and arrangement to the present series of *Science Progress*. From the nature of the case the articles necessarily take a somewhat broader view of the progress of science than is possible in a journal published in a country specially characterised by its national apathy to scientific work, and the expectations that were raised by the prospectus have been more than realised in the present number. The character of the journal will best be inferred from the following table of contents:—E. Picard, "La mécanique classique"; W. Ostwald, "Zur modernen Energetik"; G. Ciamician, "Problemi di chimica organica"; F. Raffaele, "Il concetto di specie in biologia"; H. E. Ziegler, "Die natürliche Zuchtmahl"; C Scipino, "Il carattere delle leggi economiche"; W. Cunningham, "Impartiality in History"; J. Tannéry, "Questions pédagogiques, l'Enseignement secondaire"; in addition to a large number of reviews, notes on physics and physiology, a "review of reviews," and notes. The price of each part is 7*s*. 6*d*. net; Messrs. Williams and Norgate are the London agents. The editorial office is at Milan, 16 Via Aurelio Saffi. The list of forthcoming articles is sufficient to fill a large number of volumes, and nearly every nationality is represented among the contributors.

OF all the numerous publications issued by the United States Geological Survey, none is of greater interest than the volumes dealing with the "mineral resources of the United States," a series of which we have just received the twenty-second annual issue (Washington: Government Printing Office, 1906). Each chapter in this report is a census of the production of the industry under discussion during the calendar year 1905. Although printed in smaller type, the volume is considerably larger than that of the previous year, covering as it does no less than 1403 pages. The publication of the volume has been anticipated to a great extent by the issue in advance, in pamphlet form, of the several chapters which compose it. The volume is edited by Dr. D. T. Day, and the various chapters are written by different statistical experts. The figures dealt with are stupendous. In 1905, for the seventh time, the total value of the United States mineral production exceeded the enormous sum of 200,000,000*l*. The exact figures for 1905 are 324,775,422*l*., iron ore and coal being, as heretofore, the most important of the minerals produced. The arrangement and scope of the volume are practically the same as in previous issues. The production of carbonic acid, especially at Saratoga Springs, New York, is, however, discussed for the first time, and statistics are given of the production and consumption of water-gas. A report is also included directing attention to peat in the United States, and to its great possibilities as a source of fuel. There is, too, a chapter devoted to tin, although, as a matter of fact, during 1905 no metallic tin was made in the United States, and merely an insignificant quantity of ore was obtained from the placers of Buck Creek, Alaska.

IN a paper published in the *Verhandlungen* of the German Physical Society (No. 8, p. 175), Messrs. P. Nordmayer and A. L. Bernoulli give the results of a series of determinations of the specific heat of a large number of substances, both elementary and compound, between the temperatures −185° C. and +20° C. The method used was to ascertain the weight of liquid air evaporated on adding a known weight of the substance in question, the heat required to evaporate 1 gram of liquid air being taken as 50 calories. The results obtained show that, whereas the specific heat of a compound substance such as water or benzene in the solid state diminishes very rapidly as the temperature falls, the specific heat of most solid elements is subject to a much smaller variation. The change of specific heat with temperature is most marked in the case of elements of low atomic weight, for example, sodium and magnesium. For the metals molybdenum, tungsten, and tantalum, the specific heat is almost constant for all temperatures between −200° C. and +250° C.

THE conditions which are essential in order to obtain accurate results in the estimation of potassium by the well-known method based on the precipitation of the metal in the form of its chloroplatinate are studied in a paper by M. J. Morozewicz in the Bulletin of the Cracow Academy of Sciences (1906, No. 9, p. 796). Fresenius recommended that in presence of sodium the chloroplatinate should be precipitated in 70 per cent. to 80 per cent. alcohol, but subsequent workers have advised the use of absolute alcohol instead; it is, however, shown that if absolute alcohol be used, a much larger proportion of platinum chloride is required to ensure the complete transformation of sodium chloride into its chloroplatinic salt. The results obtained are, moreover, generally high, owing to the co-precipitation of some of the sodium chloride. It is therefore advisable to adhere to Fresenius's original procedure.

IN NATURE of June 20 (p. 184) Prince B. Galitzin's experimental verification of Doppler's principle for light rays was briefly noted; and the paragraph stated that use was made of "the graduated spectroscope (Stufenspektroscope)." Mr. J. Twyman, of Messrs. A. Hilger, Ltd., writes to point out that "Stufenspektroscope" is the accepted designation of a spectroscope wherein a "Stufengitter" or echelon diffraction grating is employed.

THE British Sports Publishing Company, Ltd., have issued in their Spalding's Athletic Library the "Lawn Tennis Annual for 1907," edited by H. R. M., and "Spalding's Golfers' Annual for 1907," edited by Mr. Henry Leach. Both books are illustrated by reproductions of action photographs depicting well-known players. The price of the annuals is 6*d*. net each.

WE have received from Marconi's Wireless Telegraph Company, Ltd., a copy of a catalogue dealing with

Röntgen ray and high-frequency apparatus, instruments, and accessories. The list provides full particulars as to a variety of induction coils made by the company, interrupters, fluorescent screens, portable accumulators, and high-frequency sets. The information given as to light baths, vibration apparatus, the Finsen lamp and light, and the orthodiagraph should appeal specially to medical men. The list is conveniently arranged and admirably illustrated.

A NEW edition of "Bradshaw's Through Routes to the Chief Cities of the World" has just been published. This comprehensive handbook of colonial and foreign travel, besides giving descriptive routes of the chief railways, ocean lines, and caravan tracks, supplies an abundance of maps and plans and some useful vocabularies. The volume has been edited by Prof. A. H. Keane and Mr. Stanley Read, and its price is 5*s*. net. The route numbered 50, dealing with tours round the world, is of special interest, showing as it does the increased facilities for travel since Jules Verne wrote "Round the World in Eighty Days." The actual minimum time required for an all-round journey from London, provided no delay occurred in missing train or boat connections, is 38 days 10 hours, and Lieut.-Colonel Burnley-Campbell recently completed the circuit of the world in 40 days 19·5 hours, following the route Liverpool, Quebec, Vancouver, Yokohama, Tsaruga, Vladivostok, Harbin, Irkutsk, Moscow, Warsaw, Berlin, Ostend, Dover; but the usual quick rate of travel is still 53 days. The book may be commended to teachers as an interesting example of applied geography.

OUR ASTRONOMICAL COLUMN.

TRANSITS OF SATURN'S SATELLITE TITAN AND SHADOW.—In the Publications of the Astronomical Society of the Pacific, vol. xix., p. 125, Hermann Struve gives the following central transits of Titan and shadow during ensuing months:—

1907		G.M.T.	Distance from centre	Semi-duration of transit
		h. m.	"	h.
July 17	Shadow	8 16	0·5 S.	3·0
July 17	Titan	13 48	7·0 N.	1·6
Aug. 2	Shadow	7 30	0·2 N.	3·0
Aug. 2	Titan	12 6	6·3 N.	2·0
Aug. 18	Shadow	6 43	0·9 N.	3·0
Aug. 18	Titan	9 51	5·0 N.	2·5
Sept. 3	Shadow	5 59	1·6 N.	3·0
Sept. 3	Titan	7 42	3·2 N.	2·8
Sept. 19	Titan	5 14	1·3 N.	3·0
Sept. 19	Shadow	5 15	2·3 N.	2·9
Oct. 5	Titan	2 48	0·7 S.	3·0
Oct. 5	Shadow	4 33	2·9 N.	2·9
Oct. 21	Titan	0 31	2·2 S.	2·9
Oct. 21	Shadow	3 49	3·6 N.	2·8
Nov. 5	Titan	22 32	3·1 S.	2·8
Nov. 6	Shadow	3 5	4·3 N.	2·6

Saturn Rises at Greenwich.

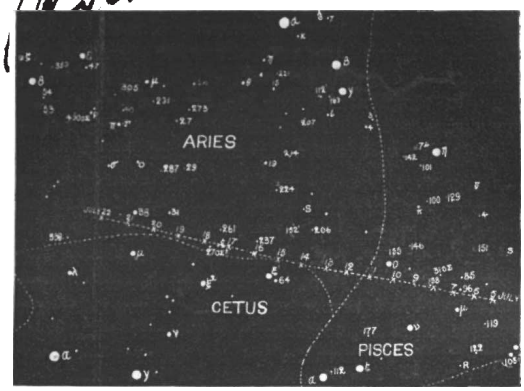
	h. m.
July 1	11 28 p.m.
Aug. 1	9 28 ,,
Sept. 1	7 24 ,,
Oct. 1	5 22 ,,
Nov. 1	3 16 ,,
Dec. 1	1 18 ,,

COMET 1907*d* (DANIEL).—A new set of elements and a daily ephemeris for comet 1907*d* are published by Dr. Strömgren in No. 4187 (vol. 191, June 29) of the *Astronomische Nachrichten*. A part of the ephemeris is given here; and, in order to facilitate the location of the object, the daily positions, with respect to the surrounding stars, are marked on the accompanying chart:—

Ephemeris 12h. (M.T. Berlin).

1907	α (true) h. m.	δ (true) ° ′	log *r*	log Δ	Brightness.
July 10 ...	1 39·0 ...	+ 7 35·1 ...	0·1318 ...	0·0216 ...	3·50
12 ...	1 49·0 ...	+ 8 16·7			
14 ...	1 59·5 ...	+ 8 58·8 ...	0·1133 ...	9·9977 ...	4·25
16 ...	2 10·5 ...	+ 9 41·2			
18 ...	2 22·0 ...	+10 23·6 ...	0·0942 ...	9·9756 ...	5·14
20 ...	2 34·1 ...	+11 5·9			
22 ...	2 46·7 ...	+11 47·8 ...	0·0744 ...	9·9558 ...	6·17

According to Dr. Strömgren's elements, perihelion will occur on September 1·44.



Apparent path of Comet 1907*d*, July 7–22, 1907.

As will be seen from the above ephemeris, the comet is brightening rapidly, and may yet become a faint naked-eye object. At present it is an easy object, when found, in a 3-inch refractor. It has a distinct stellar nucleus which, according to Dr. Zappa, of Rome, was centrally placed and of magnitude 8·5 on June 16. A faint fan-shaped tail was seen on June 21.

MARS: THE DUPLICATION OF THE SOLIS LACUS.—In Bulletin No. 28 of the Lowell Observatory, Prof. Lowell records that the Solis Lacus showed double on May 18, this being the first time that it has appeared divided since the summer of 1894. This is not a case of gemination, for the two portions are not alike either in shape or size, nor were they in 1894. Among the canals which emerge from the eastern part, a new one was detected for the first time on May 18, and has been designated Ichor. The South Polar cap has retreated southward since the last presentation, leaving dark ground behind it, and it is noticeable that the canals connecting with the Solis Lacus on the south are darker and more easily seen than those proceeding from it towards the north, although the tilt of the planet's axis should render the former the more difficult to detect. As the snow has left dark ground behind it, darker than is the case in this region in the later part of the Martian year, Mr. Lowell argues that water, and not CO_2, is concerned. As a consequence, it follows that the temperature in this region—lat. 42°–52°—was already higher than 0° C. on May 18, or, in the Martian year, on a date corresponding to March 13 of our calendar.

VARIABLE STARS.—*Astronomische Nachrichten*, No. 4186 (June 28), contains several important communications concerning variable stars. The first is by Messrs. Müller and Kempf, of the Potsdam Observatory, on the peculiar variable X Persei, which they have now observed regularly for twenty years. The present paper gives the observational record since September, 1899, and is accompanied by a light curve showing the peculiar fluctuations of magnitude which this star undergoes.

In the second paper M. Luizet records some maxima and minima of several long-period variables, among the stars dealt with being *o* Ceti, R Leonis, and S Coronæ.

The third communication is from the Harvard College